

## RULES FOR ADMISSION, ATTENDANCE AND PROMOTION FOR DIPLOMA IN BLOOD BANKING AND TRANSFUSION MEDICINE (TECH)

### 1. DURATION

One year program of 40 working weeks with 640 hours.

### 2. ELIGIBILITY

Diploma in Blood Banking and Transfusion Medicine (Tech) Examinations shall be open to a candidate who.

Has passed Higher Secondary Certificate Examination with Matric Science from Board of Intermediate & Secondary Education in Pakistan.

Any other Examination recognized as equivalent to the aforesaid examination.

Has been enrolled in a recognized institution during one Academic year preceding the examination and has duly registered himself/herself with the board.

Produced the certificate/Documents signed by the Head of the institutions he has most recently attended.

Original marks sheet of HSc Examination issued by the Board of Intermediate and secondary Education/Board of Secondary Education.

College leaving certificate, in original showing date of birth Three attested copies of recently taken photographs

Certificate showing satisfactory completion of class room work throughout the academic year preceding the examination.

Certificate showing:

80% attendance in each of the subjects, which he/she has taken up for study. 90% attendance in practical work.

3. Every candidate on the rolls of an institute shall submit his / her applications for admission on the prescribed form and remit the prescribed fee through the head of the Institute concerned so as to reach the Board by a certain date fixed by the chairman.

4. Whenever the application for admission to the examination or fee both of a candidate are received after the last date prescribed with out late fee., he/she shall pay an additional late fee provided that such application for admission to the examination and fee are received not later than the date fixed by the Chairman for receipt of forms with late fee. Applications for admission and fee of a candidate whether repeater or from a regular student will be accepted on payment of double the ordinary fee upto 30<sup>th</sup> day before the commencement of the examination. The Chairman may allow in special circumstance acceptance of admission form beyond 30 days.

5. If the application for admission to the examination is dispatched under registered cover and the admission fee is sent at least two days before the date prescribed for submission of application and the fee shall be considered to have been received in time provided these are received in the office of the Board not later than 20 days before the commencement of the examination.

6. There shall be two Terminal tests in an academic sessions to be conducted internally by the institute and shall be per-requisite to appear in the Final Examination of the board.

### ATTENDANCE:

The Head of Institute may condone shortage of attendance upto 10% on Medical or other exception ground provided that the admission form of the candidate whose attendance is less than 70% in theory and 80% in practical will not be sent provisionally.

A candidate must have cleared all dues of the Institute and the Board.

### REQUIREMENT FOR AWARD OF DIPLOMA IN BLOOD BANKING AND TRANSFUSION MEDICINE (TECH):

To qualify for award of the Diploma a candidate must pass by securing at least 50% marks in all theory and practical subjects/ papers/part of papers as specified in the scheme of studies.

### RE-APPEARANCE / COMPARTMENT:

A candidate failing in one or more subjects shall be allowed to re - appear in those subjects only in maximum two subsequent consecutive examinations.

A candidate failing in any part of practical shall be required to repeat the whole practical (i.e. Session and Final).

# Course Outline — Transfusion Medicine

COURSE OUTLINES - TRANSFUSION MEDICINE

(Section-I)

(100 CREDIT HOURS THEORY)

## 1<sup>ST</sup> TERM

### HISTORY OF BLOOD TRANSFUSION SERVICE

- AN INTRODUCTION TO BLOOD BANKING
- INDICATIONS OF BLOOD TRANSFUSION
- IMPORTANCE OF BLOOD
- PRINCIPALS OF BLOOD TRANSFUSION
- ISLAMIC PRINCIPALS FOR BLOOD DONATION/TRANSFUSION

### ORGANIZATION OF HUMAN BODY

- UNIT OF LIFE (CELL)
- ANATOMY(HEAD,NECK,THORAX,ABDOMEN & LIMBS)
- VITAL ORGANS(PHYSIOLOGY & FUNCTIONS)
- PHYSIOLOGY OF BLOOD
- PHYSIOLOGY OF CARDIOVASCULAR SYSTEM

### VITAL SIGNS

- PULSE
- BLOOD PRESSURE
- TEMPERATURE
- RESPIRATION RATE

### ROUTE OF ADMINISTRATION OF DRUGS

- ENTERAL
- PAR ENTERAL

### QUALITY CONTROL ASSURANCE & TOTAL QUALITY MANAGEMENT

- QUALITY POLICY
- PRE ANALYTICAL ACTIVITIES
- POST
- MEAN
- MODE
- MEDIAN
- ACCURACY
- PRECISION
- VARIANCE
- RANGE
- STANDARD DEVIATION
- COEFFICIENT OF VARIATION
- CONTROL CHARTS
- INTERNAL QUALITY CONTROL
- EXTERNAL QUALITY CONTROL
- RANDOM ERRORS
- SYSTEMATIC ERRORS
- STANDARD OPERATING PROCEDURES

# 2<sup>nd</sup> Term

## 1. ORGANIZATIONS AND MANAGEMENT OF BLOOD TRANSFUSION SERVICE

PRINCIPALS OF MANAGEMENT  
PLANNING  
ORGANIZING  
STAFFING  
LEADING  
CONTROLLING

## 2. BLOOD DONATION

MOTIVATION OF BLOOD DONOR'S  
TYPES OF BLOOD DONOR'S  
PRE DONATION EDUCATION  
ETHIC'S OF BLOOD DONOR'S  
BLOOD COLLECTION CAMPS  
UNIVERSAL DONATION QUESTIONNAIRE  
DEFFERAL CRITERIA

- PERMANENT DEFFERAL
- TEMPORARY DEFFERAL

COMPLICATIONS OF BLOOD DONATION

- IMMEDIATE COMPLICATION
- DELAYED COMPLICATION

POST CARE AFTER BLOOD DONATION  
MANAGEMENT OF BLOOD DONATION COMPLICATIONS  
STORAGE OF BLOOD

# 3<sup>rd</sup> Term

## 1. BEHAVIOR SCIENCE:

PERSONALITY  
BEHAVIOR  
DEALING  
ATTITUDE  
PSYCHO THERAPY  
PRESENTATION SKILLS  
VOCAL THERAPY  
FEED BACK

## 2. EMERGENCY MANAGEMENT

FAINT  
SHOCK  
ALLERGIC  
EMERGENCY MANAGEMENT  
C.P.R.

### 3. QUALITY CONTROL IN BLOOD BANKING

PERSONAL  
EQUIPMENT  
INSTRUMENT  
TECHNIQUE  
BLOOD PRODUCTS  
REAGENTS/SOLUTIONS  
DOCUMENTATION

TRANSFUSION MEDICINES  
PRACTICAL ASSIGNMENT

TOTAL CREDIT HOURS 160

## 1<sup>st</sup> Term

REGISTRATION/COUNTER DEALING	CREDIT HOURS 20
HISTORY TAKING	CREDIT HOURS 20
BLEEDING A DONOR	
MANAGEMENT OF BLOOD DONATION COMPLICATION	CREDIT HOURS 20

## 2<sup>nd</sup> Term

### BLOOD CAMPS

CLINICAL EXAMINATION (BP, TPR, RESP, WEIGHT, ETC)	
SELECTION OF SUITABLE DONOR	CREDIT HOURS 10
COLLECTION OF BLOOD	CREDIT HOURS 10
STORAGE OF BLOOD	CREDIT HOURS 10
PHLEBOTOMY	
PHLEBOTOMY SITES	
STERILIZATION	
PRICKING	
POST PHLEBOTOMY CARE & MANAGEMENT OF COMPLICATION	
COMPLICATIONS OF PHLEBOTOMY	

## 3<sup>rd</sup> Term

BLOOD TRANSFUSION	CREDIT HOURS 10
PRESENTATION	CREDIT HOURS 10
GROUP DISCUSSIONS	CREDIT HOURS 10

**1<sup>ST</sup> TERM**

**1) BLOOD**

- HEMATOPOIESIS
- COMPOSITION OF BLOOD
- FUNCTIONS OF BLOOD
- STRUCTURE OF BONE/BONE MARROW

**2) RED CELL**

- ERYTHROPOIESIS
- ENERGY REQUIREMENT OF RED CELL
- FORMATION OF HEMOGLOBIN
- BREAKDOWN OF RBC
- BILIRUBIN METABOLISM
- RED CELL MEMBRANE
- O<sub>2</sub> DISSOCIATION CURVE

**3) WHITE CELLS**

- NEUTROPHILS,BASOPHILS,EOSINOPHILS,LYMPHOCYTE,MONOCYTE
- DEVELOPMENT & MORPHOLOGY
- FUNCTIONS
- LEUCOPENIAS ETC
- LEUCOCYTOSIS ETC

**4) PLATELETS**

- DEVELOPMENT
- THROMBOCYTOPENIA
- THROMBOCYTOSIS
- FUNCTIONS

**5) IMMUNOLOGY**

- ANTIGEN
- ANTIBODY
- COMPLEMENT SYSTEM
- TYPES OF HYPERSENSITIVITY REACTIONS
- B CELL & T CELL

## **2<sup>ND</sup> TERM**

### **1. PHLEBOTOMY**

- BLOOD TRANSFUSION
- PRE TRANSFUSION NOTES
- DURING TRANSFUSION CARE/NOTES
- POST TRANSFUSION CARE /NOTES

### **2. BLOOD TRANSFUSION REACTIONS**

#### **A) IMMUNE MEDIATED REACTIONS**

- ACUTE HEMOLYTIC
- DELAYED HEMOLYTIC
- NON HEMOLYTIC FEBRILE
- NON CARDIOGENIC PULMONARY OEDEMA
- ALLOIMMUNIZATION
- ALLERGIC REACTIONS
- GRAFT VERSUS HOST DISEASE

#### **B) NON IMMUNE REACTIONS**

- CIRCULATORY OVERLOAD
- HEMOSIDEROSIS

#### **C) MASSIVE BLOOD TRANSFUSION**

#### **D) GENERAL MANAGEMENT OF TRANSFUSION REACTION**

#### **E) INVESTIGATION OF TRANSFUSION REACTION**

### **3. DISEASES TRANSMITTED BY BLOOD TRANSFUSION**

#### **A) VIRAL**

- HEPATITIS C
- HEPATITIS B
- AIDS
- OTHER BLOOD TRANSMITTED DISEASES

#### **BACTERIAL**

- SYPHILIS
- OTHERS

#### **PARASITIC INFECTIONS**

- MALARIA

# 3<sup>RD</sup> TERM

## 1) ANEMIAS

- RED CELL MORPHOLOGY & RELATED TERMINOLOGIES
- CLASSIFICATION OF ANEMIAS
- SIGN & SYMPTOMS IN GENERAL
- IRON DEFICIENCY ANEMIA
- THALASSAEMIA SYNDROMES
- SICKLE CELL ANEMIA
- APLASTIC ANEMIA
- VITAMIN B12 & FOLATE DEFICIENCY ANEMIA
- IRON CHELATION

# Course Outline Blood Banking

BLOOD BANKING

**Theory**  
**(Section 1)**

25 CREDIT HOURS

## 1<sup>st</sup> Term

1. BLOOD PHYSIOLOGY
2. HAEMATOPIESIS
3. ERYTHROPIESIS
4. HEMOGLOBIN SYNTHESIS
5. BREAK DOWN OF RBC
6. ABO BLOOD GROUP SYSTEM
7. HISTORY OF BLOOD GROUP SYSTEM
8. INHERITANCE OF ABO GROUPS
9. ANTIGENS OF ABO BLOOD GROUP SYSTEM
10. ANTIBODIES OF ABO BLOOD GROUP SYSTEM
11. BOMBAY BLOOD GROUP
12. SECRETOR NON SECRETOR
13. COMMON ANTICOAGULANTS USED IN BLOOD BANKING
  - ACD
  - CPD
  - CPDA-1
  - EDTA
16. ADDITIVE SOLUTIONS
  - ADSOL-1
  - ADSOL-2
  - ADSOL-3
17. ANTIGENS AND ANTIBODIES
  - RED CELL ANTIGENS
    - GENE PRODUCTS ON THE RED CELLS
    - CHEMICAL CHARACTERISTICS OF BLOOD GROUP ANTIGENS
    - ESSENTIALS FOR ANTIGENS SUBSTANCE
18. RED CELLS ANTIBODIES
  - STIMULATION OF BLOOD GROUP ANTIBODIES
  - IMMUNOGLOBULIN
  - CHARACTERISTICS OF DIFFERENT IMMUNOGLOBULIN
  - THE PRODUCTION OF BLOOD GROUP ANTIBODIES
19. FACTOR'S AFFECTING ANTIGEN / ANTIBODY REACTION
20. RH BLOOD GROUP SYSTEM
  - INTRODUCTION
  - FORMATION OF ANTIGEN
  - WEAK D ANTIGENS/VARIANTS/PRACTICAL D
  - ANTIBODIES OF THE RH BLOOD GROUP SYSTEM
  - CLINICAL SIGNIFICANCE OF RH BLOOD GROUP SYSTEM
  - RH DISCREPENCIES AND THEIR RESOLUTUONS

# 2<sup>nd</sup> Term

## OTHER BLOOD GROUP SYSTEMS

THE KELL BLOOD  
GROUP SYSTEM  
THE DUFFY BLOOD  
GROUP SYSTEM  
THE KIDD BLOOD  
GROUP SYSTEM  
MNS BLOOD GROUP  
SYSTEM  
LEWIS BLOOD  
GROUP SYSTEM

## ANTISERA (MONOCLONAL, POLYCLONAL)

- ANTI 'A'
- ANTI 'B'
- ANTI 'D'
- ANTI 'AB'
- LECTIN 'A1'
- BOVINE 22% ALBUMIN
- AHG/ COOMBS ANTISERA
- LISS
- CHECK CELLS
- SELECTION CRITERIA OF ANTISERAS
- STORAGE OF ANTISERAS

## BLOOD GROUPING TECHNIQUES

GENERAL RULES FOR BLOOD GROUPING

ABO GROUPING

TILE METHOD

TUBE METHOD Rh TYPING

SUB GROUPING

INTERPRETATION

## CROSS MATCHING (TECHNIQUES)

IMPORTANCE OF CROSS MATCHING

ROUTINE CROSS MATCHING

- MAJOR CROSS MATCH
  - MINOR CROSS MATCH
  - SALINE TECHNIQUES
  - ALBUMIN TECHNIQUES
  - ANTIGLOBULIN TECHNIQUES
    - DIRECT COOMBS
    - INDIRECT COOMBS
    - COOMBS CONTROL (CHECK CELLS)

COMPUTER CROSS MATCH

EMERGENCY CROSS MATCH

INTERPRETATION

SOURCES OF ERRORS

## COOMBS' TEST:

IMPORTANCE OF COOMBS TEST

ANTIGLOBULIN REAGENTS

POLYSPECIFIC REAGENT (Ig G & C3d)

MONOSPECIFIC REAGENT (Ig G & 3d)

COOMBS CONTROL (CHECK CELLS)

DIRECT COOMBS

INDIRECT COOMBS

ANTIGEN-ANTIBODIES REACTION

TYPE OF REACTIONS

AGGLUTINATION

HEMAGGLUTINATION

HEMOLYSIS

SENSITIZATION

PRECIPITATION

INHIBITION

COMPLEMENT FIXATION

ANTIBODY DETECTION

ANTIBODY SCREENING

ANTIBODY IDENTIFICATION

ANTIBODY TITRATION

HLA SYSTEM

INTRODUCTION

BIOLOGIC FUNCTION

DETECTION OF HLA ANTIGENS

NEONATAL & PEDIATRICS BLOOD TRANSFUSION PRACTICES

NEONATAL PHYSIOLOGY

PRE TRANSFUSION TESTING FOR NEONATES

SELECTION OF BLOOD COMPONENTS

CYTOMEGALO VIRUS INFECTIONS

# 3<sup>rd</sup> Term

## SCREENING OF BLOOD

IMPORTANCE OF SCREENING OF BLOOD  
SCREENING ASSAYS FOR  
MICROBIOLOGICAL AGENTS  
HEPATITIS B  
HEPATITIS C  
HIV(AIDS)  
SYPHILIS  
MALARIAL PARASITE

## METHODS OF SCREENING

LATEX / DEVICES  
PCR  
ELISA /CHEMILLUMINESCENCE  
WESTERN BLOT  
RPR/TPHA  
MALARIAL PARASITE MICROSCOPY,ICT,OTHER'S

## BLOOD COMPONENTS PRODUCTION

### RED CELLS

- CONCENTRATED (PACKED)
- PLASMA REDUCED (PARTIALLY PACKED)
- WASHED (PACKED RED CELLS)
- LEUKOCYTE DEPLETED RED CELLS

### PLATELET

- PLATELET RICH PLASMA
- PLATELET CONCENTRATE
- MANUAL METHOD
- MEGA UNIT/ SINGLE DONOR

### GRANULOCYTES

- CONCENTRATES

### PLASMA

- FRESH FROZEN PLASMA  
CRYOPRECIPITATE

## SELECTION OF LABORATORY REAGENTS

PRODUCT QUALITY  
AVAILABILITY  
COST  
ACCURACY  
STORAGE

## IRRADIATION OF BLOOD COMPONENTS

## INVESTIGATION OF Rh HEMOLYTIC DISEASE OF NEW BORN

### PRENATAL INVESTIGATION

ABO GROUPING OF MOTHER  
Rh (D) TYPING OF THE MOTHER  
ANTIBODY SCREENING & IDENTIFICATION  
TITRATION  
DIRECT COOMBS TEST  
BLOOD GROUPING OF FATHER

### POSTNATAL INVESTIGATION

ABO GROUPING OF THE BABY  
Rh (D) TYPING OF THE BABY  
DIRECT ANTI GLOBULIN TEST  
ELUTION, ANTIBODY SCREENING & IDENTIFICATION

### AUTO-ANTIBODIES

#### TYPES OF AUTO-ANTIBODIES

- WARM AUTO-ANTIBODIES
- COLD AUTO - ANTIBODIES
- CLINICAL SIGNIFICANCE OF AUTO ANTIBODIES

### APHERESIS TECHNIQUES

- USES OF CELL SEPARATORS

#### PLASMA PHERESIS

- PLASMA PHERESIS USING AUTOMATED EQUIPMENT
- INDICATION OF PLASMA EXCHANGE
- REPLACEMENT FLUID
- COMPLICATIONS OF PLASMA EXCHANGE

- THROMBO CYTAPHERESIS

- LEUCAPHERESIS
- ANTI COAGULANTS USED IN APHAERESIS PROCEDURE
- COMPLICATIONS

# **BLOOD BANKING**

## **PRACTICAL**

**CREDIT HOURS 100**

### **BLOOD GROUPING:**

- TILE METHOD            FORWARD & REVERSE
- TUBE METHOD           FORWARD & REVERSE

### **CROSS MATCHING: (COMPATIBILITY TESTING)**

- SALINE METHOD
- 22% BOVINE ALBUMIN
- COOMBS/AHG PHASE

### **COOMBS TEST:**

- DIRECT
- INDIRECT

### **RED CELL ANTIBODY SCREENING & IDENTIFICATION**

#### **TITRATION**

#### **INVESTIGATION OF A POSITIVE DIRECT COOMBS TEST**

#### **ADSORPTION**

#### **ELUTION**

### **PREPARATION OF:**

- LISS
- NORMAL SALINE
- ALSEVER'S SOLUTION
- 6% BOVINE ALBUMIN
- CHECK CELLS
- RED CELL SUSPENSION (3% & 5%)

### **QUALITY CONTROL IN BLOOD BANKING**

BLOOD BANKING  
THEORY  
(Section-II)

## 1<sup>st</sup> Term

CREDIT HOURS 30

### CELL

- CELL MEMBRANE
- NUCLEUS
- CYTOPLASM

### STERILIZATION

### NORMAL VALUES

### IMMUNOLOGY

- ANTIBODY STRUCTURE
- ANTIBODY PRODUCTION
- T CELLS
- B CELLS
- VACCINATION

### ANTIBODIES

- IgA
- IgG
- IgM
- IgE
- IgD

### PLATELETS

- STRUCTURE
- FUNCTION
- COUNTS

## 2<sup>nd</sup> Term

CREDIT HOURS 25

### BLOOD COLLECTION

- SAMPLE COLLECTION
- DONOR SAMPLE
- DONOR BLEEDING
- POST DONOR BLEEDING CARE

### BLOOD GROUPING

- ABO
- Rh BLOOD GROUP

### HEMOLYTIC DISEASE OF THE NEWBORN

### MICROSCOPE HANDLING

### ANEMIA

# 3<sup>rd</sup> Term

CREDIT HOURS 25

## CROSS MATCHING

- SALINE TECHNIQUE
- ALBUMIN TECHNIQUE
- COOMBS TECHNIQUE
- DIRECT COOMBS & INDIRECT COOMBS TEST
- FALSE POSITIVE RESULTS
- FALSE NEGATIVE RESULTS
- INTERPRETATION OF RESULTS

## COAGULATION

- ALL BLOOD CLOTTING FACTORS

## HEMOPHILIA

- HEMOPHILIA A
- HEMOPHILIA B

## QUALITY CONTROL

- EXTERNAL
- INTERNAL

# Computerization in Blood Banking

COMPUTERIZATION IN BLOOD BANKING  
(80 + 80 CREDIT HOURS THEORY & PRACTICAL)

## 1<sup>st</sup> Term

(25 + 25 Credit Hours)

### INTRODUCTION TO COMPUTER HARDWARE

#### BASIC COMPUTER ORGANIZATION (DIAGRAM)

- INPUT
- STORAGE
- PROCESS
- OUTPUT

#### BRIEF DESCRIPTION WITH EXAMPLES OF THE FOLLOWING:

- INPUT DEVICES
- OUTPUT DEVICES
- MOTHERBOARD
- STORAGE

#### NUMBER SYSTEM

- CONVERSION OF DECIMAL NUMBERS INTO BINARY BY DIVISION METHOD
- CONVERSION OF BINARY NUMBERS INTO DECIMAL BY MULTIPLICATION METHOD

#### INTERNET OPERATION

- MAKING A NEW CONNECTION
- CONFIGURING THE CONNECTION
- MAKING EMAIL ACCOUNT
- COMPOSING A MAIL
- FILE ATTACHMENT
- SEND AND RECEIVE MAILS
- FORWARDING MAIL
  - ADDRESS BOOK

## 2<sup>nd</sup> Term

### WORD PROCESSING (MS WORD)

#### FILE

- NEW
- OPEN
- CLOSE
- SAVE
  - SAVE AS
  - PAGE SETUP
- PRINT PREVIEW
- PRINT

EDIT

- UNDO
- REDO
- CUT
- COPY
- PASTE
- SELECT ALL

VIEW

- HEADER AND FOOTER
- TOOL BAR
- RULER
- ZOOM

INSERT

- PAGE BREAK
- PAGE NO.
- DATE AND TIME
- SYMBOL
  - PICTURE
    - CLIPART
    - FROM FILE

FORMAT

- FONT
  - SIZE
  - STYLE
  - FONT COLOR
  - UNDERLINE STYLE
  - EFFECTS
    - CHARACTER SPACING
    - SPACING
    - POSITION
  - TEXT EFFECTS
- CHANGE CASE

TOOLS

- SPELL CHECK
- MAIL MERGE

TABLE

- DRAW A TABLE
- INSERT TABLE
- INSERT COLUMN/S
- INSERT ROW/S
- DELETE TABLE, COLUMN, ROW
- MERGE CELL/S
  - SPLIT CELL/S
  - CONVERT TEXT INTO TABLE
  - CONVERT TABLE INTO TEXT
  - TABLE PROPERTIES

# 3<sup>rd</sup> Term

## BLOOD BANK SOFTWARE

OPENING THE SOFTWARE  
CHANGING USER'S PASSWORD  
ADDING

- NEW BRANCH
- NEW HOSPITAL NAME
- NEW PRODUCT NAME

### DELIVERY SLIP

MAKING A DELIVERY SLIP  
EDITING AN EXISTING SLIP  
RE-PRINTING

### DONATION RECEIPT

- MAKING A RECEIPT
- EDITING AN EXISTING SLIP
- RE-PRINTING

DONOR'S ENTRY IN MAIN REGISTER  
CROSS MATCH REPORT

- MAKING A CROSS MATCH REPORT
- EDITING AN EXISTING REPORT
- RE-PRINTING

BLOOD SCREENING REPORT  
TEMPORARY DONOR'S SLIP

- NEW
  - EDIT
  - RE-PRINT

OPENING A DONOR'S ACCOUNT  
OPERATING A REGULAR DONOR'S ACCOUNT  
PRINTING REGULAR DONOR'S STATEMENT OF ACCOUNT  
SEARCH

- REGULAR DONOR
  - BY ACCOUNT NO.
  - BY NAME
  - BY BLOOD GROUP
  - BY RHESUS

### TEMPORARY DONOR

- BY DATE
- BY NAME
- UNIT NO.

### DELIVERY SLIP

- BY NO.
- BY DATE
- BY PATIENT'S NAME

### CROSS MATCH REPORT

- BY NO.
  - BY DATE

- BY PATIENT'S NAME
- LOGGING OUT OF THE PROGRAM

# Faculty Members

## **ADVISORS:**

Dr. Ehsan Ullah  
M.B.B.S, F.R.C Path

Dr. Moin Uddin  
F.R.C.P (C), M.R.C.P, F.R.C.P (C)

Dr. Ashraf Memon  
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## **MEMBERS:**

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M.B.B.S, Diploma in Hematology

Mr. Sheikh Zulfiqar Ali Hashmi  
Associate Member – ACCA, UK

## **SELECTED READING:**

Principle of Transfusion Medicine (Author: Mollison)  
An Introduction to Immunohematology (Author: Bryant)  
Practical Hematology (Author: Dacie & Lewis)  
Hand Book of Transfusion Medicine (American Red Cross)  
Blood Transfusion Basic Text (World Health Organization)  
Principle of Modern Blood Banking  
Atlas of Clinical Hematology (Springer-6<sup>th</sup> edition)  
American Association of Blood Banking (AABB)